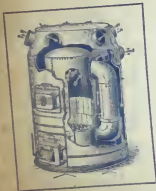


697.3  
HOME COMFORT

Steel Hot-Air Furnaces



MANUFACTURED ONLY BY THE

WROUGHT IRON RANGE CO.

Washington & Lucas Aves., from 19th to 20th Sts.

OCCUPYING THE ENTIRE BLOCK.

SAINT LOUIS, MO.

ESTABLISHED 1864.

PAID-UP CAPITAL \$500,000.



1864

\*

"HOME COMFORT"

1892

\*

# STEEL HOT-AIR FURNACES,

BURNING HARD OR SOFT COAL.

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The Best Steel Hot-Air Furnaces ever offered to the Public.

Positively No Dust. No Gas. No Smoke. They have been thoroughly tested and tried.

Not One has ever been Removed on account of Failure to Give Perfect Satisfaction.

---

\* MANUFACTURED ONLY BY THE \*

\* WROUGHT IRON RANGE CO. \*

WASHINGTON AND LUCAS AVENUES. FROM 19th TO 20th STREETS.

OCCUPYING THE ENTIRE BLOCK.

ESTABLISHED 1864.

PAID-UP CAPITAL, \$500,000.

SAINT LOUIS, MO.



## \* INTRODUCTORY. \*

PLEASE READ, AND NOTE CAREFULLY EVERY POINT WE MAKE.

IN the following pages we present a few facts of vital importance on the subject of hot-air heating and ventilating, and ask a careful investigation into the merits of our "Home Comfort" Steel Furnaces, and their capability of producing on a large scale both heat and circulation by our methods of construction and setting.

In the construction of our furnaces the greatest care has been observed to produce the very best article that can be made of steel and malleable iron: and, while simple in design, are of such form as will produce the best and most satisfactory results.

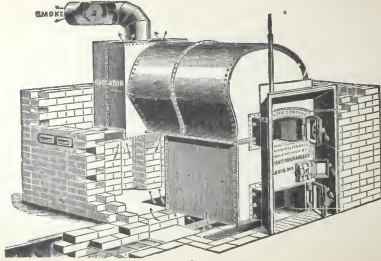
The steel domes are hand riveted, as close as steam boilers, so that it is impossible for gas to escape through an imperfect seam; and there being no openings except the fire door and smoke escape, it is impossible for gas and smoke to enter a room through the hot-air pipes.

The fire boxes are lined with the *best quality furnace tile* that our manufacturers can produce.

The body of the furnace is made of No. 10 Open-hearth Steel Plate, boiler riveted; the fire box is lined with fire clay tiles (best St. Louis make); hence no air that enters the furnace, and no gas generated, can possibly pass into hot-air pipes. They are so set as to have plenty of fresh air fed to them through the cold-air ducts: and by our system of rapid circulation, the air passes promptly through the pipes and is not burned. The heat from our furnace contains an abundance of moisture; hence no water pan is needed.

## Our "Home Comfort" Steel Dome Brick-Set Furnace.

Illustrated as it sits on Foundation over  
Cold-Air Chamber.



Cold-Air Duct is shown with Bearing Bars,  
ready to receive Brick Covering.

## Heating Capacity of "Home Comfort" Brick-Set Furnaces.

No. 1.—9 Rooms, 16 x 16 x 11, or 26,000 cubic feet. Weight 2,128 pounds.

No. 2.—11 Rooms, 16 x 16 x 11, or 31,000 cubic feet. Weight 2,388 pounds.

No. 3.—13 Rooms, 16 x 16 x 11, or 37,000 cubic feet. Weight 2,500 pounds.

No. 4.—15 Rooms, 16 x 16 x 11, or 45,000 cubic feet. Weight 2,700 pounds.

The capacity given above is for dwellings.

If all circumstances are favorable, such as well-built house, well ventilated, hot-air pipes properly located, with good elevation, it would add perhaps 20 per cent. to the above.

Size of Smoke Pipe to be used:

Nos. 1 and 2, . . . . . 8 inches.      Nos. 3 and 4, . . . . . 9 inches.

Size of Fire Boxes:

No. 1, length 22 in., width 20 in., depth 15 in.	No. 3, length 35 in., width 20 in., depth 15 in.
No. 2, " 22 " " 20 " " 15 "	No. 4, " 39 " " 20 " " 15 "

Length of Furnace and Radiator:

No. 1, . . . . . 7 ft.	No. 3, . . . . . 7 ft. 10 in.
No. 2, . . . . . 7 ft. 6 in.	No. 4, . . . . . 8 ft. 6 "

Size of Dome:

No. 1, . . . . . length 46 in.; width 34 in.	No. 3, . . . . . length 58 in.; width 34 in.
No. 2, . . . . . " 50 in.; " 34 "	No. 4, . . . . . " 66 in.; " 34 "

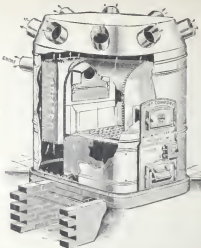
# "HOME COMFORT" STEEL DOME PORTABLE FURNACE.

No. 1.—Dome, 26 in. wide, 29 in. long, 53 in. high. Has Steel Radiator,  $8\frac{1}{4} \times 23 \times 36$ . Fire Box,  $19 \times 20 \times 14$  deep. Capacity, 9,000 cubic feet, with 4 pipes.

Extreme height, with Casing on, 70 inches. Weight, 1,390 lbs.

No. 2.—Dome, 26 in. wide, 29 in. long, 53 in. high. Has Steel Radiator,  $12 \times 28 \times 36$ . Fire Box,  $19 \times 20 \times 14$  deep. Capacity, 10,300 cubic feet, with 5 pipes.

Extreme height, with Casing on, 70 inches. Weight, 1,480 lbs.



No. 3.—Dome, 29 in. wide, 32 in. long, 55 in. high. Has Steel Radiator,  $12 \times 28 \times 36$ . Fire Box,  $23 \times 20 \times 16$  deep. Capacity, 13,500 cubic feet, with 6 pipes.

Extreme height, with Casing on, 72 inches. Weight, 1,670 lbs.

No. 4.—Dome, 29 in. wide, 32 in. long, 55 in. high. Has Steel Radiator,  $16 \times 29 \times 40$ , with two 8-inch Radiating Tubes. Fire Box,  $23 \times 20 \times 16$ . Capacity, 17,800 feet, with 7 pipes.

Extreme height, with Casing on, 72 inches. Weight, 1,880 lbs.

Perspective View, showing Grate and Fire Box.



## OUR NEW ROUND PORTABLE FURNACE.

**F**or many years past we have been, and are still manufacturing a class of Steel Furnaces that have no superior either in material, workmanship, or heating capacity.

The material, construction and perfect manufacture of our "HOME COMFORT" STEEL HOME FURNACE, however, make it cost more than the average house owner is willing to place in a Heater. So evident has this been to our owners that we concluded to make a Furnace to meet the demands of those who are seeking this comfort at a low price, where a low priced Furnace is wanted and cost would not enter largely in the total amount of expense. Our owners then would not permit us to construct an article that could be called—CHEAP—any of our manufactures are well known to be *the best* of their kind that can be produced.

We have just introduced a NEW ROUND STEEL FURNACE of design as illustrated on page 8, and we are proud with our full guarantee as one of the *best and most powerful heaters* that can be produced for the home.

We have taken special pains in its construction to secure perfect operation and avoid the best known defects.

While we offer this Furnace at a price within the reach of all, we still have furnished the same with the best material used is the best, and no part has been lighted for the purpose of producing a cheap stove.

We have thoroughly tested these Furnaces before offering them for sale, and are prepared to back them as our best Furnace made at its price—that is equal to it in construction, quality and capacity.

We desire to call attention to the following points:

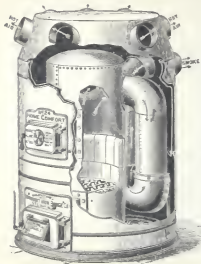
SIMPLICITY OF CONSTRUCTION AND OPERATION.  
QUALITY OF MATERIAL.  
MADE OF HEAVY WROUGHT STEEL.  
ECONOMY IN FUEL.  
CLEANLINESS.

FREE FROM GAS, DUST, & SMOKE.  
BURNS HARD COAL, SPLIT LOGS.  
A GRATE THAT CANNOT GET Clogged OR BURNED.  
LARGE RADIATING SURFACE.  
MADE EITHER FOR PORTABLE OR HOUSEHOLD USE.

We solicit a close scrutiny and examination of the Furnace before purchase.

# Our New Round Steel "Home Comfort" Portable Furnace.

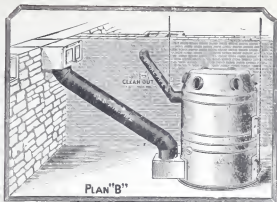
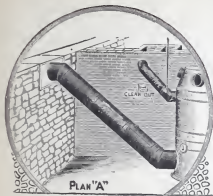
DESIGN PATENTED, APRIL 19, 1892.



	No. 24.	No. 28.	No. 32.
Diameter of Furnace.	24 inches.	28 inches.	32 inches.
Diameter of Fire Pot.	20 "	24 "	28 "
Height of Furnace.	57 "	58 "	60 "
Diameter of Casing.	48 "	53 "	60 "
Height of Casing.	72 "	72 "	74 "
Diameter Radiator Tubes.	10 "	10 "	13½ "
Diameter Smoke Pipe.	8 "	8 "	9 "
Weight of Furnace only.	896 lbs.		
Weight complete.	1006 "		

Furnace made of	-	-	-	-	-	No. 10 Steel.
Radiators made of	-	-	-	-	-	" 14 "

View of Furnace as Set, with Section of Casing and Furnace cut out, showing Interior.



Illustrations above show our methods of introducing cold air from window to air chamber of the  
**NEW ROUND STEEL FURNACE.**

## DIRECTIONS FOR OPERATING

1st. It is possible on account of a damp or defective flue, you may have trouble in starting first fire; in such cases open the smoke pipe damper and start a fire in the radiator clean-out with light kindling.

2nd. After the flue has become warm, open the draught in ash door; close check draught wheel in fire door, and see that the clean outs in radiator are tight; then start fire in furnace when you see the draught is all right, put in large, dry kindling, filling the fire box nearly full, and fill it with coal after the wood is burning well.

3rd. To keep a fire over night, thoroughly shake the ashes down by several vigorous motions of the shaker-lever, then fill the fire box with coal even with top of the tile linings, close damper in smoke pipe as much as draught will permit without causing gas or smoke to come out of the front; close draught in ash door tight, open check draught in fire door, leave cold air window partly open, admitting as much air as experience may dictate; or close the window tight and open the door in cold air box, taking the air from basement, which may be advisable in very cold weather.

4th. In the morning open smoke pipe damper, shake the grate thoroughly, then fill fire box full of coal, open the cold air window, keeping it open during the day.

5th. Clean out ashes from ash pit every morning regularly; an accumulation of ashes under the grate bars would burn them out.

6th. If any one of the hot air pipes refuses to act, close the dampers in several of the pipes around it until the pipe not working does its work properly; then open the other dampers.

7th. The door in the cold air box should never be opened when there is dust or smoke in the basement, as it will go directly to the rooms above.

## "HOME COMFORT" FURNACE.

8th. All openings in the basement must be made air tight, as the effect of cold air on the tin pipe stops circulation.

9th. Clean radiators out through clean-outs. If soft coal is used, it may be necessary to burn out the soot once in three or four months. This may be done by burning a small quantity of resin, placing it in the clean-out, and pushing it back in the radiator.

10th. Water must not be allowed to accumulate either in the cold-air duct or underneath the furnace. If this is permitted you will get little or no heat, and will soon burn out the furnace.

A most important fact seems to be lost sight of by many who have furnaces in their dwellings: Attention is given to affairs of the household above the basement or cellar, and this section of the residence too frequently overlooked. If personal attention of the head of the family is given to the furnace morning and night, the surroundings kept perfectly clean, and ashes not allowed to accumulate, there will be no difficulty in keeping the atmosphere of the house perfectly pure and clean.

Servants will often omit and postpone this duty unless looked after. See that the ashes are cleaned out from under the grate every day, and do not permit them to accumulate.

**REMEMBER** that the cold-air window should *never* be closed unless the door in the cold air box is open into the basement. One or the other *must always* be open when the furnace is being used. Neither should all the registers be closed at one time, as it would prevent a circulation of air to the furnace, and is liable to do great injury to the furnace.

By strict attention to these directions, you will have pure air, no smoke, no dust, no gas, and a small consumption of fuel.

## ✧ OUR CONTRACTS. ✧

IN contracting to put in our "Home Comfort" Steel Furnaces, we agree to supply—

*First*—All necessary iron and steel work for the furnace complete. This includes brick ~~the~~ lining for fire box, galvanized iron double casing, if the furnace is a portable, or iron covering bars for top of furnace, with all brick work complete, it set in brick.

Cold-air duct of proper size, either under cellar floor from window to furnace, properly bricked at sides and top, and bottom cemented, or galvanized iron duct leading direct from cold-air window to furnace, as best suited for its operation.

Galvanized iron air-duct and cold-air window connections according to plans A and B, page 9, when New Round Furnace is used.

Cold-air box at window with door leading to cellar; if brick air-duct is used.

Hot-air pipes leading from furnace to wall pipes, or risers, of sufficient capacity to distribute the heat to rooms.

Wall pipes, or risers, are furnished by us when required, and always wrapped with asbestos paper to prevent wood-work from catching fire, or wood-work is protected by iron lath.

Registers are also supplied, when desired, of any selected finish.

*Second*—The purchaser must protect us against any accumulation of water in or around the furnace chamber or the cold-air duct, as it would prevent the reception of necessary air to the furnace and delivery of hot-air to the rooms above.

The purchaser also provides a proper and acceptable place for the furnace to stand, to gain satisfactory results; and also provides flues of proper size and height to supply necessary draught for the furnace; and the furnace must be operated according to our printed instructions.

When these agreements are complied with, we guarantee the furnace will give seventy degrees of heat when the thermometer is at zero outside.

## CONDITIONS RELATING TO FURNACE HEATING.

The sale and use of hot-air furnaces needs to be fully understood between the parties, so far as the risk and responsibility rests between them, to any contract that relates to the heating of any building or buildings, to prevent any misunderstanding as to the risk the seller takes and the user assumes, without a special contract to the contrary. In recommending a certain sized furnace to warm a certain sized house, the calculation is formed from the cubic contents of the house in cubic feet. Furnaces warm, as a rule, a certain number of cubic feet of air space, according to size, under favorable conditions. This is known as capacity of the furnace. That is all the manufacturer can vouch for. Next comes a large number of conditions that affect the size of the furnace needed for any particular house. For instance, one house containing the same number of cubic feet of space that another may have, would require double the number of units of heat to warm it, and keep it warm, or maintain the heat continuously to a certain degree, depending on its perfect construction or less perfect workmanship—whether the walls are built heavy and tight: whether of brick, stone or wood as material: whether the walls are furled out, to prevent conduction: whether the windows are large and numerous: whether the doors opening to the outside are large and exposed to wind: whether the ceilings are high or low: whether the rooms are enclosed tightly: whether proper ventilation is provided to draw off the foul air: whether the smoke chimney has a good, continuous draft: whether the construction of the house is such that a furnace can be centrally located, so the pipes conducting heat would be nearly uniform, and short as possible to reach the several rooms: whether the pipes are all large enough that conduct the heat to the several rooms, as well as the registers: whether the furnace is set up properly, with all its connections: whether the cold-air

box is the proper size, with a valve to regulate its flow whether good and proper fuel be used: whether the furnace has good care in supplying the fuel, and also the proper regulation of the dampers to maintain a uniform draft according to the weather. All these conditions have to do with the perfect and economical working of the furnace required to heat any kind of building. Some houses are heated with half the fuel that others are, of the same size in cubic capacity, depending on the kind of building, and care and judgment in the attention, and the exposure to wind, etc. So no general rule can be given as to the capacity of furnace needed to heat a certain house, without these conditions are known. The best remedy for uncertainty as to just the size is to get a furnace ample in capacity to heat the building, making fair allowances for "discounts." The best built houses are heated the easiest with less fuel, as the warm air can be retained in the rooms. Much less coal is required to supply the waste. It is not what it costs to warm the house, but what it costs to keep it warm: as a poorly built house will condense and waste three times as much heat per hour as one well built. When one man says, "I burned only six tons of coal to heat my eight room house," his neighbor, having the same sized house says he burned twelve tons of coal, and "my house is not as warm as yours, with the same size and kind of furnace in use." It would seem strange if the causes were not known which are, a less substantial and tightly built house, poorer artificial ventilation, and less economy in management. But the difference is usually charged to the manufacturer of the furnace, who, in fact, has nothing to do with or control over the different conditions that exist in different houses; he builds furnaces—not houses. The remedy is to buy a furnace to heat the kind of house you have; and, if poorly built, do not blame the manufacturer of the

## CONDITIONS RELATING TO FURNACE HEATING—Continued.

furnace you may try to warm it, if not satisfactory to you.

These are facts all should understand. When building a house many of these defects can be avoided. These same defects would prove as detrimental in heating by any system where hot air flows into the rooms to warm them. To get some idea of the supply of warm air from a furnace which flows into any room having a ten inch pipe direct from the heater, in cold weather when a good fire is maintained, would say that the pipe will deliver 500 cubic feet

per minute, at 200 degrees temperature, into any room above the furnace. A room 16x20 feet, 12 feet high, contains 3,840 cubic feet, with 500 per minute, would take less than ten minutes to fill the room full of fresh warm air, and changing it every ten minutes through the day. So the difference in fuel required to heat such a room is governed by the amount of leakage and condensation, as if a room will heat in ten minutes, if not for the rapid condensation would remain warm, and no more heat supply needed.

## CAPACITY OF HOT-AIR FURNACES.

The determination of the heating capacity of hot-air furnaces is not made by any definite rules, though we presume every hot-air furnace man has his own way of proportioning a furnace to the building to be heated. The basis for such a calculation would naturally be the number of square feet of grate area; but the construction of the heating drums of furnaces varies so that we think even were a definite rule determined upon it would have to be modified for each style of heater. Then again the satisfactory heating of a house by hot air depends so very largely upon what we may term the local conditions. A badly constructed house, in an exposed situation, it is almost impossible to warm comfortably by a hot air furnace, owing to the fact that the strong winds of winter will drive the hot air currents to the leeward side of the building. A furnace may have ample capacity for supplying hot air for a building of a certain cubic contents, provided the outer atmosphere is still; but let a strong cold wind arise, and it is more than likely that on the windward side of the house the rooms will receive very little if any warmth through the registers. The same difficulty obtains with indirect steam or hot water heating, where the hot air is all taken from a

single heating chamber in the cellar. Most heating engineers acquire an extra sense, as it were, that tells them intuitively what sized furnace is needed for a house of certain construction and situation. We think, however, that few of them would be able to reduce their means of judging in the matter to definite statements. Another difficulty involved in formulating a rule regarding hot air furnaces, is the fact that, beside the difference in location and the difference in construction of dwelling houses, there is also considerable variation in the amount of glass area. Where proportioning heating surface for radiators, the rules take account of all these different factors, but we do not think that they are carefully considered when a hot-air system is installed.—*Metal Worker*, March 7, 1891.

We desire to make a few suggestions in the interest of our customers. In some cases it might be difficult to locate a furnace to supply warm air to all the flues built in the house. This could be overcome if all the details of location of furnace, length, size and shape of air pipes and flues, size and position of smoke flue, position and size of cold air duct, were carefully studied and included in plans and specifications.

## CAPACITY OF HOT-AIR FURNACES—Continued.

The air pipes should be short, and as nearly of exact lengths as possible; sharp corners should be avoided. Air pipes should be built in interior walls, and the flues themselves should be either circular or square, or as nearly such shapes as possible; the flat flue is very objectionable. The turning should be about twice as large as the flue section.

## LOCATING A FURNACE.

A furnace should be located or so placed as to have the outside pipes as nearly as possible of equal lengths, avoiding sharp corners, and giving them an elevation of at least an

The smoke flue should be near the furnace; it should be large, square and smooth, and the chimney top should be a little higher than the highest point of the house. There should be no contraction of the flue at the top, a chimney pot smaller than the flue is an injury to the draft.

inch to the foot. The parts of the building most exposed to cold winds should have preference of larger pipes and elevation.

## THE COLD-AIR SUPPLY

It should be remembered that the south, southeast or northwest winds prevail, and that the winter winds are from that direction, and the cold-air supply should be of the size of cold-air duct seen in the picture.

When there is no sewerage and no sewerage fail for drainage, and a room or of water seeping in the cold air duct it will be necessary to dig a well to one side of the furnace (open) through air duct. All water will then col-

lect in it, and can be easily removed. Never drain cold-air duct or pit into sewer containing waste from the house.

A suitable board should cover the window through which air passes into the cold-air duct, protecting it from cold rain or snow.

We will, at any time, cheerfully and promptly furnish estimates of the size and details of a furnace needed to heat a given house.

## ESTIMATES.

To secure an accurate estimate, it is important for us to have the following information:

A plan, sketch or diagram showing points of the compass of hall, of back, and whether it extends to attic. Size of each room on each floor, and height of ceilings. Height of base under garden.

Locate chimney on sketch, and give size of flue, of what materials house is built. If built near or adjoining other houses, or if it stands to itself. The kind of fuel you will use. State whether you want a brick set or portable furnace.



## VENTILATION.

An adult person vitlates ten cubic feet of air per minute. A lamp or gas jet fouls as much air as three men, or thirty cubic feet of air per minute. Suppose a medium sized sitting room with four people and two gas jets—the air must be changed every fifty minutes to keep it pure.

### How Shall the Air be Changed?

As air is heated it expands and becomes lighter per cubic foot. If all the air is heated equally, it remains at rest after expansion; but if hot air is in the presence of cold air, the latter, by reason of its greater heaviness, forces its way down and drives the hot air up. The moving force of air currents is the greater weight of the colder air.

This, then, is the means by which foul air is driven out and pure air put in its place. Pure external air will always drive out foul air if you give it a chance. The air around the furnace is heated by contact with the steel, and the cold air is drawn through the cold-air box, and forces the hot air up the pipes. This rising air in turn drives all before it, provided there is a continuous open passage from the furnace to the top of the ventilating shaft. In its course it enters a room through a large register; it must have nearly as large an escape opening through which to continue its journey.

In a room (which may be treated as an enormous enlargement of the pipe from furnace to ventilating shaft) the air arranges itself according to its temperature—the hottest lies along the ceiling, the coldest along the floor. The hottest is the newest and purest. The coolest is the oldest, and therefore the foulest. The air is gradually cooling from contact with the walls and windows. When hot air enters a room, it rises at once to the ceiling, and spreads across it. If there is an escape there, an open window or a ventilator,

it goes out, leaving the cooler, foul air almost undisturbed. From this we see that a window slightly open at the top may cool a room, but not purify it.

Air once entering a room, if there be no escape near the ceiling, comes slowly down the closest walls and crosses the room to the ventilating opening. The escape register should therefore be near or in the floor, and near a flue, and opposite the inflow of warm air. This escape air is warmer than outside air. So that if the ventilating flue is large and smooth, and not too cold, it will increase the draught (as the moving force is commonly called). If either the hot-air register or ventilator is shut, then all ventilation ceases, except such as leaks through the doors and windows. Hot air may be perfectly pure, and cold air may be very impure. The thermometer is therefore no guide to purity.

The ventilation should be in or near the floor; but if a large quantity of heat and foul air is produced by groups of gas jets, there should be openings directly over the chandeliers sufficient to carry off the products of combustion. These last remarks are applicable to a hall or church especially.

In a dwelling the demands for ventilation are readily met without over-heating the room. But in a church, hall or school room there is great danger of over-heating while properly ventilating. In all such cases there should be arrangements for admitting a large volume of air at a comparatively low temperature. A room filled with people, and once warm, needs a large quantity of slightly warmed air. The people themselves are an important source of heat.

It is hardly necessary to add that the air supply should be perfectly pure. A leaky furnace which, under any circumstances, contributes smoke or gas to the air-flues, is a great injury to health and comfort. The furnace should be absolutely gas tight, and must have a full supply of cold

## VENTILATION—Continued.

The quality of the ventilation is of course of great importance, and it is necessary to have a system of ventilation which will not only remove the impurities from the air, but will also supply the room with a sufficient quantity of fresh air. The system of ventilation should be such as to keep the air in the room at a temperature of about 60° F., and to keep the humidity at about 60 per cent.

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## House Poison.

The system of ventilation should be such as to keep the air in the room at a temperature of about 60° F., and to keep the humidity at about 60 per cent.

## FURNACE WORK AND MANAGEMENT.

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## FURNACE MANAGEMENT—Continued.

ers, and money counting themselves with selling the appliances, and then leaving the work of putting in the plant to outsiders, such as plumbers and steam fitters.

It is poor judgment to practice economy by purchasing a cheap, flimsy-made furnace, which soon gives way and must be set aside for another, making double expense, not considering the annoyance which is likely to occur just at a time when the furnace heat is needed.

The "Home Comfort" Steel Furnace is not a cheap article, and does not compete with those of that class.

### Location and Setting of Furnaces.

To do good heating the furnace should be set in position so the pipes to the registers will be short. Most people think a register must be placed in the cold corner of the room, and are not aware that this sometimes makes a pipe quite long, and often so long that it will not heat at all. If the pipe is elevated the heat will move in proportion to the elevation. A pipe to do good heating should have two feet rise in 10 feet distance from furnace, with this elevation heat can be conveyed a long distance, unless there are cold currents of air coming in contact with it. A cold cellar is quite a detriment to heating. Open gratings or windows will always affect a pipe. A room will heat quicker with a short pipe entering the register box or wall pipe as near the furnace as possible. Try to have the furnace placed so as to make the pipes nearly equal in length, the shortest pipe will do the best work, conditions being equal. Do not take one pipe off the top of the furnace unless there are no others to be taken off the top. We often see one pipe drawn over the furnace, while others are run a long distance from the side of furnace, don't expect much from the long one in this case.

Next to a good line of importance is elevation. If we have plenty of rise to the pipes we can generally secure good heating. The more elevation the more heat from the same fire. All heat constructors should be set on a line with the furnace and the same grade of elevation, unless you can give the longest one the most. The longest pipe should be equal in size to the distance and amount of heating space. Suppose you have two rooms to heat exactly alike, one pipe will reach to one room in 10 feet, the other 20 feet, make the longest pipe one third the largest, and if you can give it the most elevation do so. Let the heat rise naturally, don't destroy it by trying to make it go a long distance, this is the greatest mistake in setting up furnaces. If you cannot get elevation dig down until you can.

To induce the register to heat open an adjoining room or have another register in the same room with a connection to the bottom of the pipe, or connect to a warm flue.

The best place for the register for the first story is in the floor opposite the grate or ventiler.

Pipes to the second story should be at least one third smaller than on the first floor, as the elevation increases the draft. Pipes should always have dampers. A second-story pipe will allow of a longer horizontal pipe than the first story. It is a great advantage to keep all pipes warm.

### Management.

In taking care of a furnace the first and most important thing, aside from putting in coal, is to keep it free from ashes everywhere. Ashes may collect in the flues where the smoke pipe enters until it stops the draft; sometimes ashes are allowed to accumulate under the grate until the air is completely shut off. In this case it will only take about 20 minutes to clean a grate that would otherwise last for

## FURNACE MANAGEMENT—Continued.

years. If you shut off the air with a hot bed of coals it will destroy the furnace.

To manage a furnace economically, the first thing to be done is to get the house thoroughly warm and then see that it does not get cold. It will cost some coal to fill the house with warm air, but after this is effectually accomplished, less coal will be required to keep it warm than if it is constantly cooling and heating. It is certainly greater economy to keep fire all night than to force a heavy fire in the morning to drive out the cold air that has gained possession during the night. A furnace that will not keep a fire all night is not a profitable furnace, because in extreme cold weather you will have to drive the fire so much harder. It is also economy to keep your furnace nearly full, as by having in but little coal it more readily becomes ignited through and burns faster. When the furnace is hot and the coal is well ignited, shut up the furnace as close as it will stand, and keep up sufficient heat if you have a strong cold air connection: reduce it at night when the fire is shut down, but be sure and open it in the morning; don't forget this and wonder why you don't get the heat. In the morning, if your fire is pretty low, open your draft and put in but a small quantity of coal until it gets to burning, then increase until it is full. Do not use a poker on top of the fire, especially if you have just put on fresh coal. If you are burning hard coal it is bad treatment to ever disturb it on top. In filling furnace with any kind of fuel, the bottom or ash doors should be closed and the dampers in smoke pipe should be opened; otherwise, unless the draft is remarkably good, smoke and gas will be forced out of feed

door: by always closing the bottom doors this is generally avoided. If you have a furnace that will heat quick and strong, the heat is sometimes complained of in mild weather: in that case don't shake the grate; keep your furnace just as full as ever, but keep the draft shut and allow the ashes to clog. Do not misunderstand this and allow the ashes to accumulate under the grate. No matter how many ashes there are on top of the grate it won't do any harm, but will lessen combustion, but to accumulate under the grate will destroy it.

To get a quick, strong heat large furnaces are the most economical, because you can soon stop the draft up the flue. You can move more air, not heat it so hot, have less strain on the construction, keep closed more hours, feed it less often, it produces better circulation, and consequently a better class of air. Never shut all the registers at once, as the heat must go some place. If you are not needing a room heated on a cold morning, you may close off that register, or registers, but be careful they do not all get closed at one time, or you will either burn the furnace or heat the register too hot; it being hot might burn the carpet or floor. Fires occur because the heat conductors are made of galvanized iron, or the register shut off and burn the floor, or the iron smoke pipe is too near the wood, or the furnace built too high up under the joists. If these four things are avoided, it is the safest mode of heating. Rats will build their nests around a steam pipe and the nests will get on fire: a piece of slate snap out on the carpet from the grate; a stove pipe will fall down from a stove, etc.; but a furnace is perfectly safe if properly managed.

## BAD FLUES.

The best furnace is of no use if the flue is cramped. The strength of the chain is only the strength of its weakest link. So the efficiency of a smoke flue depends upon the amount of gas and smoke that can flow around its sharpest corners and through its smallest section. No furnace flue should be less than 9 by 13 inches, and if possible 13 by 13 inches. It should have a smooth interior, easy corners, and be of equal dimensions from bottom to top. This [important] matter concerns our health as well as our fires. When the flues are too small, or have cramped cor-

ners, the draft is of necessity poor, and when the fire door is opened a puff of gas and smoke is liable to enter the furnace room, and find its way through doors and stairways into the rooms above. The tight joints, as perfected in the "Home Comfort" Furnace, prevent it from entering the warm air flues. The flue should be near the furnace. If smoke pipe is long, enlarge in sections, increasing size 1 inch every 12 feet.

We urge architects and owners of buildings to see that large, smooth, unobstructed furnace smoke flues are built.

## PLANNING A HOUSE.

We would offer the following suggestions, when planning for a house, to be considered before the furnace is placed in position. We give these points for the benefit of intending purchasers living at a distance.

**FIRST.**—Have basement at least 4 feet in the clear, under the girders, and thoroughly drained, so that no water can pass into the cold-air duct or pit.

**SECOND.**—Try to have no cross walls. Support the floors above with wood or iron girders, resting on iron or wood columns. Set furnace in the center of the basement, and after the house is completed cut up this part to suit. A basement is or ought to be used primarily for the heating of the house, and every other purpose for which basements are ordinarily used should be a secondary consideration.

**THIRD.**—If possible, allow no pipes to be carried up in the outside walls.

**FOURTH.**—Be sure none of the hot-air pipes in the building run horizontally; they ought to have an elevation of one inch to the foot.

**FIFTH.**—Have smoke pipe made neatly square or round, and not less in area than 13 1/2 by 13 1/2, finished perfectly smooth inside, and carried above every other point on the building.

**SIXTH.**—Have ventilating flues in every room to be heated.

**SEVENTH.**—Have basement tight, and all cask or other openings as closely shut as possible.

**EIGHTH.**—Window where cold air is to be taken should be located on the north, northeast or northwest side, and large enough to give an abundant supply—say 30 x 45 in the clear, and at least one foot above the ground line outside.

## A Word to Church Builders.

Most churches are so planned that the smoke flue is too far from the furnace. Please avoid this.  
Use convex registers in all walls.

## STEAM AND HOT AIR.

Great efforts are constantly made against warm-air furnaces in favor of steam for heating purposes, asserting that the heat from steam heaters is more moist and healthy than that from warm-air furnaces, etc., which is not true, as steel, heated to any possible point attained in hot-air furnaces has no power to abstract moisture from the air. Theory and practice in this respect are in perfect accord. Each confirms the other. Buildings specially arranged for drying cotton, cloth, wool, lumber, and other materials, are usually heated by steam pipes.

When the radiators or coils are placed in the compartments there is no circulation, as the air in them is heated by direct contact with them; when they are placed in the cellar, under the hot-air flues, the steam often condenses before it reaches those flues furthest from the boiler, making it necessary to keep up large fires and heavy pressure to

obtain the required heat in those compartments during cold weather.

Other disadvantages in the use of steam for heating purposes are: The expense in erecting and maintaining the apparatus; the time required to raise the water to the boiling point and fill the radiators with steam; the difficulty of obtaining moderate heat in mild weather, and the necessity of watchfulness to avoid damage by accidents that frequently occur.

In the use of steam for any purpose there is always more or less danger, as pressure, no matter how small, implies force, and with the ability to produce force the possibility of explosion, as safety valves and similar devices are not always reliable, especially when left to the care and management of unskilled, inexperienced or careless servants—a fact too often proved.

## LASTING QUALITIES.

The lasting qualities of a furnace can be quickly decided. The average life of a cast iron furnace is three years, of a wrought iron furnace ten years, of a wrought steel furnace fifteen years. The reason why wrought steel is more lasting than wrought iron, is because steel plate is more homogeneous, higher in tensile strength, and has a ductility equal, if not superior, to the best coal blast charcoal bloom iron.

The hot and cold flanging qualities of this steel compare favorable with the best grades of iron, and at the same time there are none of the blisters which are so common in the charcoal bloom plate iron, nor is there any danger of imperfect welds.

The blisters in plate iron are due to the imperfect welding of the different layers. When this occurs, the layer

next to the fire expands more rapidly than the one to which it should be tightly welded, and the result is a blister or crack, which, of course, greatly weakens the iron, and renders it more liable to leak. Steel plate, on the other hand, being made of solid homogeneous ingots or slabs, has no layers, and therefore cannot blister as in the case of iron.

The elastic limit and ultimate tensile strength of steel is at least one-third greater than iron, and the same strength is therefore obtained with thinner plates, or greater strength with the same thickness of steel. However, we do not reduce the thickness of plates on account of using steel. The cost of steel plate is more than the best quality of iron, but when you take into account the greater durability of steel, you can readily see that in the end it will be cheaper to buy the best material.

## OUR SANITARY HEATER.

The "Home Comfort" Steel Hot Air Furnace is designed especially as a sanitary heater—the radiating surface being very large; the air ducts large, and the furnace made of the best material, the different parts being riveted together as securely as in a steam boiler—the only possible chance for gas is through the fire door, and that only occurs through the carelessness of the person having charge, but very seldom from any puffing, as the flues of the furnace are ample large. It sometimes occurs, though, that the party having charge, in order to save coal or keep the fire for an indefinite length of time, will close draught door in ash pit tight, open the check in the fire-door, and close the damper in smoke-pipe; and there being no other opening for the gas to escape, it comes through the check in the fire door, and being much lighter than air, rises to the top of the basement and to the rooms above, through any openings that might be left.

If only a small quantity of heat is required, close up all the openings in the front of the furnace and leave the damper open just enough to carry off the gases—the damper of our furnace has an opening in the centre for the purpose of allowing the gas to escape in the event that it is closed, and accomplishes the purpose for which it was designed if there is only an ordinary draft; but when there is a poor draft, the opening in the damper is not large enough, and damper must be opened some.

The dampers are connected by pulleys and chains leading to the front of the furnace, and any one can in a short time learn how to adjust them so as to regulate the passage of the gas out through the flues. Some draughts are much stronger than others, hence the damper would in these be kept nearly or entirely closed, and in others more or less open.



## Churches and Schools using "Home Comfort" Steel Hot-Air Furnaces.

The following Churches, Colleges, etc., are heated with "Home Comfort" Steel Hot Air Furnaces:

Baptist Church, Red Oak, Iowa	One 3 Port. and one 1 B. S.
Christian Church, Logansport, Ind.	1 B. S.
Christian Church, Palmyra, Mo.	6 Port.
Christian Church, Canton, Mo.	2 B. S.
Christian Church, Fulton, Mo.	5 and 4 B. S.
Christian College, Columbia, Mo.	
Church of the Ascension, St. Louis, Mo.	3 Port.
Church of the Messiah, St. Louis, Mo.	3 B. S.
College of Physicians and Surgeons, St. Louis, Mo.	6 Port.
College, Post Graduate (Medical), St. Louis, Mo.	
Congregational Church, St. Louis, Mo.	and 4 Port.
Unit. Presb. terian Church, Kirksville, Mo.	1 B. S.
Episcopal Church, Cabaniss Place, St. Louis, Mo.	1 Port.
Episcopal Union Home, St. Louis, Mo.	Two 4 B. S.
First Baptist Church, Mt. Vernon, Ind.	Two 4 Port.
First Baptist Church, Vincennes, Ind.	1 B. S.
First Baptist Church, Lincoln, Neb.	Two 4 B. S.
First German Presb. Church, St. Louis, Mo.	1 Port.
First Methodist Church, Emporia, Kan.	4 B. S.
First Methodist Church, Sedalia, Mo.	One 3 and two 4 B. S.
Fifth Baptist Church, St. Louis, Mo.	
Methodist Church, Warrenton, Mo.	1 B. S.
Mt. Calvary Church, St. Louis, Mo.	2 B. S.
Presbyterian Church, Carrollton, Ind.	4 B. S.
Presbyterian Church, Carrollton, Ind.	3 B. S.
Protestant Hospital, St. Louis, Mo.	1 B. S.
St. George's Episcopal Church, St. Louis, Mo.	3 B. S.
St. John's Episcopal Church, St. Louis, Mo.	4 Port.
St. Paul's Methodist Church, St. Louis, Mo.	2 Port.
Trinity Church, Omaha, Neb.	

Trinity Episcopal Church, Carrollton, Ill.	3 B. S.
Trinity Lutheran Church, St. Louis, Mo.	3 B. S.
Congregational Church, Old Orchard, Mo.	2 Port.
Methodist Church, Leon, Iowa	3 B. S.
Christian Church, Carthage, Ill.	Two 6 Port.

We are also heating the following Public Schools with our Home Comfort Steel Hot-Air Furnaces:

Collinsville, Ill.	One 3 and two 4 B. S.
Roodhouse, Ill.	One 1 and one 4 B. S.
Greenfield, Ill.	Two 1 B. S.
Upper Abon, Ill.	Two 2 B. S.
Trenton, Ill.	Two 2 and two 4 B. S.
Bowen, Ill.	Two 6 Port.
Grafton, Ill.	Two 4 B. S.
Lebanon, Ill.	Two 4 B. S.
Anna, Ill.	Two 3 B. S.
Carthage, Mo.	
Whitehall, Ill.	2 B. S.
Mound City, Ill.	3 Port.
Panora, Iowa	One 1 Port. and two 1 B. S.
Audubon, Iowa	4 B. S.
Maynard, Iowa	Two 6 B. S.
Winfield, Iowa	3 B. S.
Anthony, Kas.	Two 5 B. S.
Sedgwick, Kas.	Two 4 B. S.
Ida, Kas.	Four 4 B. S.
Owensboro, Ky.	Three 3 B. S.
Florence, Ala.	Two 4 B. S.



## Parties using "Home Comfort" Steel Hot-Air Furnaces - Continued.

We give a few names of prominent residents at places outside of St. Louis who are using our Home Comfort Furnaces in their homes:

Burr, G. C. ....	Kirkwood, Mo.
Bateman, F. M. ....	Roadhouse, Ill.
Barclay, Hon. Shepard .....	Jefferson City, Mo.
Charles, Miss M. L. ....	Webster, Mo.
Cowen, E. P. ....	Dallas, Texas.
Campbell, H. F. ....	Carbondale, Ill.
Davis, H. C. ....	Lincoln, Neb.
Davis, C. C. ....	Centralia, Ill.
Dodge, W. A. ....	Webster, Mo.
Doxier, N. B. ....	Little Rock, Ark.
Deemer, Judge H. E. ....	Red Oak, Iowa
Eueman, H. A. ....	Lexington, Ky.
Holme, J. T. ....	Hannibal, Mo.
Morgan, E. A. ....	Maroon, Ill.
Osborn, R. O. ....	Paris, Mo.
Parinton, J. H. ....	Webster Groves, Mo.
Pittinger, G. L. ....	Centralia, Ill.
Swan, J. C. ....	Carrollton, Ill.
Schless, B. ....	Alton, Ill.
Siebldna, L. W. ....	Webster, Mo.
Turner, H. S. ....	Eliah, Ill.
Thompson, R. H. ....	Webster, Mo.
Tiebetor, Dr. ....	Fulton, Mo.
Willard, Judge ....	Atlantic, Iowa

We desire to add a few names from our list of General Dealers in different sections of the country, who have placed our "Home Comfort" Furnaces in the residences of their customers:

Barnes, G. S., & Son .....	Colorado Springs Colo.
Butte Hardware Co. ....	Butte, Mont.

Bartley Hardware Co. ....	Cresport, Ill.
Boots Bros. ....	Garrett, Iowa
Braunzel Bros. ....	Whitehall, Ill.
Brewer, Geo. H. ....	Meriden, Conn.
Bristow Bros. ....	Moberly, Mo.
Bird, Wm., Jr., & Son .....	Mt. Vernon, Ohio
Baker & Russell .....	Sions City, Iowa
Bridges & Coughlin .....	Seattle, Wash.
Baker, Winard & Co. ....	Rock Island, Ill.
Carey, M. ....	Colquhville, Ill.
Conroy, Thos. ....	Denver, Ill.
Churchill & Wetmore .....	Cambsburg, Ill.
Chapman & Ransom .....	Hurstburg, Mo.
Chenoweth, Curtis .....	Portland, Ore.
Denton Hardware Co. ....	Des Moines, Iowa
Duggan Hardware Co. ....	Graceland, Mo.
Dwyer, Logan & Co. ....	Cincinnati, Wyo.
Dunning Bros. & Co. ....	Westport, Mich.
Ellis Bros. ....	Edgewood, Ill.
Fones Bros. ....	Little Rock, Ark.
Farmer, J. C. ....	Hannibal, Mo.
Farnes, M. H. ....	Logan City, Utah
Garnes & Cummings .....	Fairfield, Iowa
Heidinger, R. ....	Belleville, Ill.
Heizer, G. D. ....	Grand Island, Neb.
Hall, J. H., & Bro. ....	Lincoln, Neb.
Hank Bros. ....	Wichita, Kas.
Heegard & Co. ....	Warrington, Del.
Hogelfritz Hardware Co. ....	Sedalia, Mo.
James & Gilbert .....	Storm Lake, Iowa
Johnson & Sons .....	Jacksonton, Ill.
Johnson & Bro. ....	Plattsmouth, Neb.
Klauser, Peter .....	Dubuque, Iowa
Klopping, H. F. ....	Newton, Iowa

# Dealers who sell "Home Comfort" Steel Hot-Air Furnaces—Continued.

Keller, E. A. & Bro.  
 Litchfield Gas, Oil and Fuel Co.  
 Lawrence & Lister  
 Lehman Hardware and Imp. Co.  
 Lee & Chubbuck  
 Landon & Roberts  
 McCrillis Bros.  
 Morris, J. W.  
 Morehouse, Wells & Co.  
 Muscota Mercantile Co.  
 Manning & Bee  
 McNish & Graham  
 Nauden & Nye  
 Ogden & Sharp  
 Pueblo Hardware Co.  
 Peters Hardware Co.  
 Pengle Bros.  
 Plaine R. R. & Co.  
 Pinkerton & Evans  
 Proff, F. E.  
 Phelps, J. C. & Son  
 Pfaff, John  
 Powell, H. M.  
 Read, G. H. & Bro.  
 Reid & Wither  
 Rhodes, T. H.  
 Roulton, P. R.  
 Scott, J. M.  
 Shaver, W. A.  
 Starnett Hardware Co.  
 Starnett, W. P.  
 Seeley, Lloyd & Co.  
 Spurr, Kelley & Whipple  
 Trates & Keller

Edwardsville, Ill.  
 Litchfield, Ill.  
 Manchester, Iowa.  
 Newton, Kas.  
 West Point, Neb.  
 Winona, Minn.  
 Carthage, Mo.  
 Cairo, Ill.  
 Decatur, Ill.  
 Missoula, Mont.  
 Northfield, Minn.  
 Warner, Neb.  
 West Union, Iowa.  
 Orde, Neb.  
 Pueblo, Colo.  
 Emporia, Kas.  
 Grand Forks, Dak.  
 Independence, Iowa.  
 Monmouth, Ill.  
 Monro, Ill.  
 Rochester, Ill.  
 St. Charles, Mo.  
 Taylorville, Ill.  
 Unionington, Ill.  
 Maize, Ill.  
 Anna, Ill.  
 Keokuk, Iowa.  
 Burlington, Iowa.  
 Matango, Iowa.  
 Nevada, Mo.  
 Omaha, Neb.  
 Potosi, Mo.  
 Wichita, Kas.  
 Edwardsville, Ill.

Tolson, J. D.  
 Thompson, J. B.  
 Tonney, E. F.  
 Utah Stove & Hardware Co.  
 Van Velsor & Petro  
 Williams, J. W., Hdw. & Stove Co.  
 Whitlington, Stearns & Co.  
 White, Packard & Co.  
 Wright & Dietrich  
 Walter & Baumgardner  
 Zahner & Battell Mfg Co.  
 Zimmerman, G. S.  
 Fayette, Mo.  
 Longmont, Colo.  
 Vinton, Iowa.  
 Salt Lake City, Utah.  
 Mason City, Ill.  
 Springfield, Mo.  
 Hot Springs, Ark.  
 Marquette, Mich.  
 Ottawa, Kas.  
 Ottawa, Kas.  
 Kansas City, Mo.  
 Terre Haute, Ind.

A Partial List of Parties who are using "Home Comfort" Furnaces in this City.

Anderson, Robt., 2633 Washington Ave.	2 B. S.
Arnold, Prof. D., Rugby Academy	2 B. S.
Allen, Mrs. H. L., 1216 Taylor Ave.	24 Port.
Appel, J. F., 2721 Locust St.	2 Port.
Austin, Porter, 507 Minerva Ave.	24 Port.
Brown, M. R., 3550 Cook Ave.	1 B. S.
Battle, J. W., 2813 Lucas Ave.	2 B. S.
Borg, A. W., Belle Ave., near Grand	1 B. S.
Beach, E. N., 5610 Von Verson Ave.	4 Port.
Bagnall, Wm., 3423 Washington Ave.	2 B. S.
Busey, Thos. H., 2524 Herbert St.	2 Port.
Brooks, W. E., 3220 Morgan St.	4 Port.
Boone, B. W., 4216 Washington Ave.	1 B. S.
Broadhead, Col. J. O., 3223 Lafayette Ave.	4 Port.
Blossom, H. M., 2830 Pine St.	3 B. S.
Brown, L. A., 4000 Delmar Ave.	2 Port.
Becker, E. C., 10 S. Broadway	4 Port.
Barmier, H. A., 2043 Bell Ave.	1 B. S.

# Parties using "Home Comfort" Steel Hot-Air Furnaces--Continued.

Burr, W. E., 3419 Morgan St. ....	3 B. S.	Church, St. Paul's (Methodist), St. Louis Ave. ....	2 Port.
Beall, Capt. G. T., 2821 Gamble St. ....	3 Port.	Church, St. George's, Beaumont and Chestnut ....	3 B. S.
Berls, Alf., 3437 Morgan St. ....	2 B. S.	Church, First German Presby., 10th & Autumn ....	1 Port.
Blanke, A. H., Trustee, 4319 Finney Ave. ....	24 Port.	Church of Ascension, Cabanne Place ....	3 Port.
Blanke, A. H., Trustee, 4361 Finney Ave. ....	24 Port.	Cook, D. G., 3829 Washington Ave. ....	3 B. S.
Blanke, A. H., Trustee, 2911 Henrietta Ave. ....	24 Port.	Clark, C. T., 3555 Westminster Place ....	6 Port.
Blanke, A. H., Trustee, 2913 Henrietta Ave. ....	24 Port.	Corwin, Geo. W., 5572 Clemens Place ....	3 Port.
Booth, Wm., 3709 Washington Ave. ....	2 B. S.	Cantwell, Isabel, 4381 Delmar Ave. ....	2 B. S.
Birge, J. C., 2949 Lay Ave. ....	3 B. S.	Chipley, L. M., 4000 Delmar Ave. ....	1 B. S.
Barnes, Dr. A. S., 3013 Easton Ave. ....	2 B. S.	Cook, A. E., 4145 Bell Ave. ....	1 B. S.
Brookings, R. S., 3349 Lucas Ave. ....	1 B. S.	Christopher & Simpson, 3421 Laclede Ave. ....	24 Port.
Bullock, R. B., 2226 and 2228 Franklin Ave. ....	2 B. S.	Church, St. John's (Epi.), Hickory & Dolman ....	24 Port.
Banmann, J., 3438 Washington Ave. ....	2 B. S.	Clark, J. C., Barthold's Station. ....	1 Port.
Bayless, S. M., Lindell and Taylor Aves. ....	2 B. S.	Clark, C. C., Chamberlain Ave. ....	24 Port.
Boyer, Jos., 1543 Chouteau Ave. ....	3 Port.	Cozzens, W. F., 2637 Washington Ave. ....	3 B. S.
Baumau, M., Pine St. ....	4 B. S. Cyl.	Cozzens, W. F., Taylor Ave. ....	1 B. S.
Ball, W. S., Delmar Ave. ....	28 Port.	Christopher, J., 1436 Mississippi Ave. ....	3 Port.
Bromwich, W., Grand and Lee Aves. ....	2 Port.	Cecil, Mrs., 3408 Finney Ave. ....	1 B. S.
Bronson, W. A., Maryland and Lay Aves. ....	2 B. S.	Chappell, W. G., 3810 Westminster Pl. ....	28 Port.
Briggs, C. E., 2747 Olive St. ....	4 B. S.	Clark, F. L., 2331 Lucas Ave. ....	2 Port.
Blair, Mrs. F. P., 3519 Lucas Ave. ....	2 B. S.	Christopher, E. M., Evans Ave. ....	24 Port.
Bethune, J. H., 4363 Delmar Ave. ....	2 B. S.	Condry, J. N., 3949 Washington Ave. ....	3 Port.
Bracket, G. W., 9824 Julian Ave. ....	2 B. S.	Corbit, Jas. M., 3992 Delmar Ave. ....	3 B. S.
Berkman, E., 5885 Etzel Ave. ....	3 Port.	Christopher & Simpson, 3421 Laclede Ave. ....	1 Port.
Bentjes, Pauline, Mrs., 4316 Lucky St. ....	24 Port.	Cousland, H. Mrs., Delmar, west of Newstead Ave. ....	24 Port.
Burr, Geo. C., Kirkwood, Mo. ....	24 Port.	Coester, Fred., Henrietta St. ....	21 Port.
Bisanti, J. J., Grand Ave., south of Tower Grove. ....	24 Port.	Cornelius, Mrs. M. E., Thornby Place ....	28 Port.
Black, Abraham, 4764 Hogan Ave. ....	24 Port.	Duestro, Louis, 1794 S. Compton Ave. ....	3 Port.
Bartlett, J. A., Vernon Ave. ....	32 Port.	Donovan, J. T., 513 N. 6th St. ....	1 Port.
Culver, H. H., 3301 Morgan St. ....	4 B. S.	Doyle, L., 4320 Morgan St. ....	2 Port.
Culver, H. H., 1003 Olive St. ....	2 Port.	Davis, J. D., Vandeventer Place ....	3 B. S.
Culver, W. W., 1001 Olive St. ....	5 Port.	Donnell, J. W., 4857 Westminster Place ....	3 Port.
Culver, W. W., 4004 Washington Ave. ....	2 B. S.	Diedeshelmer, F. W., 3521 Henrietta St. ....	4 Port.
Cong. Church, Compton & Lafayette Aves. ....	3 & 4 Port.	Daly, W. M., Kirkwood, Mo. ....	24 Port.



## Parties using "Home Comfort" Steel Hot-Air Furnaces—Continued.

Johnson, C. M., 2933 Chestnut St. ....	4	Port.	Martha Parson's Hospital, Channing Ave. ....	4 & 5	B. S.
Johnson, W. P., 5857 Plymouth Ave. ....	2	B. S.	Martin, J. G., Maple & Union. ....	3	B. S.
Johnson, S. A., Lucas and 33rd St. ....	1	B. S. Cyl.	Magner, John, 4247 Delmar Ave. ....	24	Port.
James, C. B., 4055 Finney Ave. ....	2	Port.	Merrell Drug Co., 620 Washington Ave. ....	Two 24	Port.
Knapp, Geo. H., 3117 Washington Ave. ....	3	B. S.	Moore, Gen. E. A., Hamilton & Plymouth. ....	4	Port.
Kaime, D. F., 3731 Delmar Ave. ....	1	B. S.	McClure, R. P., 3143 Sheridan Ave. ....	2	Port.
Knight, G. H., 5858 Julian Ave. ....	1	B. S.	Miller, E. H., 2921 Franklin Ave. ....	6	Port.
Kelley, A. T., 4388 Lindell Ave. ....	4	B. S.	Musick, P. U., 3828 Thomas St. ....	2	B. S.
Kennell, Mrs. A. C., Grand Ave. & Caroline. ....	2	B. S.	Moses, Pr. G. A., 5358 Cabanne Place. ....	2	B. S.
Klag, J. C., Barthold's Sta., Mo. ....	2	Port.	McMurray, W. A., 3043 Washington Ave. ....	1	Port.
Knox, C. G., Delmar and Grand Aves. ....	3	B. S.	Mt. Calvary Church, Lafayette & Jefferson. ....	4	B. S.
Kleinschmidt, A. A., 2112 Waverly Place. ....	24	Port.	Meier, H. M., 3551 Delmar Ave. ....	2	B. S.
Klein, Jos., 1515 Corn Place. ....	24	Port.	Maxwell, Joseph, 3970 Washington Ave. ....	3	B. S.
Largue, Mrs. M. A., 3840 Lindell Ave. ....	2	B. S.	McCluney, J. H., 3115 Locust St. ....	4	B. S.
Lowenstein, M., 1818 Kennett Place. ....	3	B. S.	Murphy, Mrs. N., 2651 Russell Ave. ....	1	Port.
Lawrence, Dr. J. J., 3811 Pine St. ....	5	B. S.	Morrison, Mrs. A. L., 4540 Lindell Ave. ....	5	B. S.
Luehring Bros., 1922 Saltshury St. ....	5	Port.	Nason, Mrs. E. (deceased), 5466 Plymouth Ave. ....	4	Port.
Lawrence, Henry B., Virginia Ave. & Meremac. ....	2	Port.	Meyer, Mrs. M. L., 4131 Westminster Place. ....	1	B. S.
Lange, W. B., 6th & Haven Sts. ....	1	B. S.	McK. Jones, R., Westmoreland Place. ....	5	B. S.
Lucas, H. V., 3311 Washington Ave. ....	1	B. S.	Miller, Geo. W., 3941 Finney Ave. ....	24	Port.
Lane, F. A., 3640 Pine St. ....	4	B. S.	Murphy, M. H., 7012 Marquette Ave. ....	24	Port.
Lionberger, J. R., Cabanne and Union Ave. ....	4	B. S.	McKeighan, J. E., 74 Vandeventer Ave. ....	3	B. S.
Love, J. E., 70 Vandeventer Place. ....	3	B. S.	Miltenberger, H. B., 3828 Cook Ave. ....	2	Port.
London & Clark Millinery Co., 111 N. Broadway. ....	4	B. S.	Martin, Jno., Pine and Grand Aves. ....	2	B. S.
Lindaley, J. B. & Son, Delmar & Sarah. ....	Three 2	Port.	McNally, Hugh, 3515 Cook Ave. ....	24	Port.
Lambert, J. W., Vandeventer Place. ....	3	B. S.	Mitchell, Jno., 2823 Thomas St. ....	1	Port.
Lewis, A. M., Jefferson, Pine & Olive. ....	3	Port.	Mass, J. W., 1102 Second Carondelet Ave. ....	1	Port.
Lesser, Wm., 3512 Chestnut St. ....	3	Port.	McMillan, Wm., 3023 Glasgow Place. ....	3	B. S. Dome.
Lasher, F. E., 4946 Reber Place. ....	5	Port.	McRee, W. J., 5811 Cabanne Ave. ....	5	B. S.
Lowrey, H. T., 3914 Delmar Ave. ....	2	B. S.	McLaughlin, M. A., Julian and Hamilton Aves. ....	3	Port.
Lightner, L. H., Clemens and Goodfellow Aves. ....	24	Port.	McCormack, S. T., 3857 Delmar Ave. ....	4	B. S.
Lane, F. A., 3640 Pine St. ....	3	B. S.	McAllister, A., Hamilton and Easton Aves. ....	1	Port.
Lockwood, J. Y., 3731 Chestnut St. ....	3	Port.	Merrell's Drug Store, 620 Washington Ave. ....	Two 24	Port.
Lindsay, J. A., 4013 Castleman Ave. ....	28	Port.	Meyers, G. J., 3855 Westminster Place. ....	28	Port.

# Parties using "Home Comfort" Steel Hot-Air Furnaces—Continued.

Merrweather, M., 37 6 Delmar Ave.	32	Port.
Nisbit, W. W., 696 Michigan Ave.	1	B. S.
Noel, H. M., Alden Place	1	B. S.
Noonan, T. S., 3146 Cook Ave.	2	B. S.
Nulsen, J. W., 3516 Washington Ave.	1	B. S.
Nagel, L., 1518 S. Jefferson Ave.	1	B. S.
Noxen, T. C., 2011 Ringer St.	Two	Port.
Nigemann, G. A., 3661 Finney Ave.	2	Port.
Nelson, N. O., 13th & Morgan	2	Port.
Newman, Soc., 3542 Pine St.	2	B. S.
Nicolls, Rev. S. J., 2631 Washington Ave.	4	Port.
O'Brien, Jno. J., 3561 Finney Ave.	1	B. S.
Proa, Hospital Association, 1011 N. 18th	1	B. S.
Palce, N. G., Calhoun Place	3	B. S.
Potter, H. S., Calhoun Place	3	B. S.
Parsons, Chas., 28th & Pine	1	Port.
Prosser, T. J., Lindell and Boyle	3	B. S.
Posey, E. E., N. Clifton Heights	2	Port.
Porter, S. S., 5507 Westminster Place	1	B. S.
Poss, Mrs. H., 3870 Plymouth Ave.	4	Port.
Printon, J. H., Webster Groves, Mo.	24	Port.
Post, L. W., 3361 Delmar Ave.	4	Port.
Parsons, Martha, Hospital, Channing Ave. & School	4	Port.
Parkhurst, Mrs. E., 5408 Plymouth Ave.	4	Port.
Perks, H., 2827 Caroline St.	2	B. S.
Peurce, J. L., 3305 Washington Ave.	2	B. S.
Peters, Mrs. E., Delmar Ave., west of Newstead	28	Port.
Peiffer, Adolph, 3631 Lucas Ave.	28	Port.
Quinlivan, S. J., West Bell Place	5	Cyl.
Quernheim, Herman, 3820 Nat. Bridge Rd.	3	Port.
Quernheim & Mitchell, 409 N. 4th St.	4	Port.
Quilan, James, 4448 Garfield Ave.	24	Port.
Ree, F. R., Westminster Place	4	Port.
Robbins, S. P., 4036 Forest Park Boulevard	4	Port.

Russ, Alex., 2702 N. Grand Ave.	3	B. S.
Ray, Sim., 3102 Washington Ave.	2	B. S.
Rover, Mrs. E., 4141 Cook Ave.	3	Port.
Reynolds, E., 3050 Cook Ave.	2	Port.
Reed, E. M., Cates Ave.	1	B. S.
Rosebrough, J. H., Cook bet Pendleton & Newstead	28	Port.
Shepley, Mrs. M. A., 50 Vandeventer Place	4	B. S.
Soest, H., 1527 Park Ave.	4	Port.
Siegel, A., 3414 Laclede Ave.	1	B. S.
Stifel, C. A., 966 Chouteau Ave.	2	B. S.
St. James' Church, Clifton Heights	4	B. S.
Simpson, W. S., 1428 Mississippi Ave.	2	Port.
Sellers, J. M., 2628 Locust St.	3	B. S.
Subit, Mrs. A., 3036 Delmar Ave.	3	B. S.
Smith, Chas. Bland, Vandeventer Place	3	B. S.
Stickney, W. A., 3515 Morgan St.	2	B. S.
Stimpkins, G. W., 3820 Washington Ave.	4	B. S.
Stewart, J. C., Bell and Vandeventer	1	B. S.
Steinbrenner, A. G., 12th and Laurel Sts.	24	Port.
Stewart, A. M., Bell Ave.	2	B. S.
Spoeri, M., Lay Ave. and Page	2	B. S.
Sawyer, F. O., 3419 Franklin Ave.	1	B. S.
Schneider, Mrs. Joseph, 1423 Hickory St.	2	B. S.
Siegel, A., 3452 Laclede Ave.	4	Port.
Skinker, T. E., Skinker Road	3	B. S.
Schultz, J. A., Dillon and Hickory	4	Port.
Steinburg, Chas., 421 N. Broadway	0	Port.
Smith, G. C., 3814 Pine St.	1	B. S.
Scudder, C. W., Vandeventer Place	3	B. S.
Stephens, C. D., 1749 S. Grand Ave.	3	B. S.
Shaw, Mrs. E. A., Delmar bet. Newstead & Taylor	24	Port.
Shall, E. G., 1821 Corn Place	24	Port.
Shaffner, L. H., 1108 Monroe St.	3	Port.
Stedman, L. G. W., 2905 Pine St.	3	B. S.

## Parties using "Home Comfort" Steel Hot-Air Furnaces—Continued.

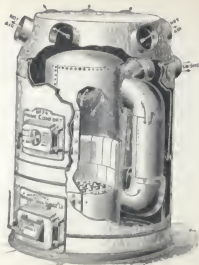
Schleiffarth, E. L., 3804 Ende Ave.....	24	Port.	Walker, D. D., Vandeventer Place.....	2	B. S.
Sublett, E. H., 4152 Washington Ave.....	2	B. S.	Wehber, J. R., 2008 N. 21st St.....	3	Port.
St. L. College Physicians & Surgeons, 1100 N. Market	5	Port.	Woodward, Prof. C. M., 1751 Missouri Ave.....	1	B. S.
Schmidt, H. A., 3417 Pine St.....	1	B. S.	Weyer, G. W., 4030 Westminster Place.....	1	B. S.
Seipel, Jacob, Michigan Ave. bet. Nagle & Robert.	24	Port.	Wynn, John, 2745 Russell Ave.....	3	Port.
Stephenson, Cora B., 3518 Morgan St.....	3	B. S.	Wehking, Chas., 3323 S. Jefferson Ave.....	4	B. S.
Taussig, G. W., 2838 Chestnut St.....	1	B. S.	Waibel, L. F., 7112 Michigan Ave.....	2	B. S.
Tinkham, J. H., 2825 Locust St.....	2	Port.	Wise, Capt., 3953 Delmar Ave.....	2	B. S.
Tudor, Henry, 4235A St. Ferdinand Ave.....	1	Port.	Wilson, A. E., 4057 McPherson Ave.....	3	B. S.
Taylor, Geo., 2738 Washington Ave.....	4	B. S.	Wickham, C. A., 401 N. Taylor Ave.....	2	B. S.
Tupper, Dr. Paul Y., Delmar and Pendleton.....	1	B. S.	Wenneker, Chas. F., 2313 University St.....	3	Port.
Tamby, M. C., 3710 Finney Ave.....	2	B. S.	Wiseman, Mrs. A. M., Pine St.....	2	B. S.
Tiffany, Dexter, Vandeventer Place.....	2	B. S.	White, T. Ewing, 4216 Lindell Ave.....	4	B. S.
Tiernan, J. H., 2825 Locust St.....	4	Port.	Wernse, Henry H., 1901 Lafayette Ave.....	1	B. S.
Tinkham, J. N., Jennings Station.....	2	Port.	Wickersham, W. R., 771 Bayard Ave.....	24	Port.
Tamm, W. B., Shenandoah Ave.....	28	Port.	White, H. L., 3611 Delmar Ave.....	2	B. S.
Tobias, E. H., 3413 School St.....	2	B. S.	Wulfring, D., Second St.....	4	B. S.
Tolton, W. J., Jennings Station.....	24	Port.	Welsh, R. H., 4912 Morgan St.....	3	Port.
VanHouten, S. C., 3855 Delmar Ave.....	3	B. S. Cyl.	Woodruff, J. W., north side Bartmer Place.....	24	Port.
Vandeventer, S., 4277 Page Ave.....	24	Port.	Watson, H.....	24	Port.
Van Winkle, D. S., 4414 Morgan St.....	3	Port.	Wolff & Co., M. A., 1522 Washington Ave.....	32	Port.
Vogt, H. H., 1434 Cass Ave.....	4	Port.	Wickersham, Dr. W. H., 4223 Cook Ave.....	24	Port.
Vogt, G. W., 1443 Blair Ave.....	4	Port.	Zimmerman, J. J., Marcus and N. Market		
Vall, C. A., Manchester Road.....	4	B. S.	Zeigler, T. C., 3429 Morgan St.....	3	Port.
Von Vedelstadt, R. Park, 4252 Washington Ave...	3	Port.			





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FURNACE FACTORY IN THE WORLD.



FACTORY ON WASHINGTON AND LUCAS AVES . FROM 19th to 20th STS . ST. LOUIS, COVERING ENTIRE BLOCK.